REMARKS

This is a full and timely response to the outstanding non-final Office action mailed November 9, 1999. Claims 1-53 remain pending in the present application. Of these, claims 1, 5, 8, 27-33, 35, 48-50 have been directly amended with this response. It is believed that the foregoing amendments present no new matter to the instant application. Reexamination, reconsideration, and allowance of the presently pending claims is respectfully requested. Each objection and rejection presented in the Office action is discussed in the remarks that follow.

A. Drawings Objections

The drawings have been objected to under 37 C.F.R. 1.83(a) for allegedly not showing every feature of the invention specified in the claims. Specifically, the drawings are objected to for not showing a separator, a supply valve, and the ends of the injection well, the well casing and drop tube being disposed in the vadose zone or at the groundwater level.

In response to this objection, the drawings have been amended to illustrate a separator (33) of claims 5 and 33 and the ends of the injection well, the well casing and drop tube being in the vadose zone or at the ground water level, as in claims 14, 15, 17, 18, 20, 21, 36, 37, 39, 40, 42, and 43. It is asserted that no new matter has been added to this application by the foregoing drawing amendments.

Applicant respectfully brings to Examiner's attention that the supply valve of claim 8, disclosed in the specification on page 15, line 21, is illustrated in Fig. 2 as element number 16. A marked-up copy of the originally filed drawings is included with the present response which shows the necessary

changes in red ink. Formal drawings will be submitted upon receipt of the Notice of Allowability, should such notice issue.

B. Specification Objections

The specification has been objected to for containing certain informalities. Specifically, the Office action identifies that on page 13, line 23, it appears as if "well 26" should be changed.

In response to this objection, page 13, line 23 of the specification has been amended to read "an injection well 18."

Although the above described amendment results in a change to the specification, it is respectfully asserted that no new matter has been added. It is applicant's belief that the specification, as amended, is not objectionable and it is therefore respectfully requested that the objection be withdrawn.

C. Specification Amendments

Various amendments have been made to the specification through this response to correct typographical and grammatical errors, to provide antecedent basis for all terms in the claims, and to provide a correct and accurate description of applicant's invention as originally disclosed. Although these amendments effect several changes to the specification, it is respectfully asserted that no new matter has been added.

D. Claim Rejections - 35 U.S.C. § 112

1. Rejections under 35 U.S.C. § 112, Second Paragraph

Claims 5, 8-10, 27, 29-32, 33, 35, 49 and 50 have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. In particular, the Examiner states that claims 5, 8-10, 27, 29-32, 33, 35, 49 and 50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office Action pints out specific objections regarding each claim.

In addition to the amendments regarding specific objections, various other changes have been made to the claims to provide an accurate and precise description of applicant's originally disclosed invention.

In view of the above described amendments to the claims, it is respectfully asserted that claims 1 - 53 currently define the invention in the manner required by 35 U.S.C. § 112. Accordingly, it is respectfully requested that the rejections to these claims be withdrawn.

E. Claim Rejections - 35 U.S.C. § 102(b)

1. Rejection under 35 U.S.C. § 102(b)

Claim 27 has been rejected under 35 U.S.C. § 102(b) as being anticipated by Land (U.S. Patent No. 5,615,9714).

The rejection states that Land anticipates the present invention in that Land shows a decontamination system having a product supply means (16); means for introducing the product into a

subsurface zone (20); vacuum means (col. 10, lines 6-11); and extraction means (22). Applicant respectfully traverses this rejection.

As identified above, independent claim 27 has been directly amended through the present response. Notwithstanding this fact, applicant presents the following discussion of claim 27 in view of the Land reference for the Examiner's consideration.

2. The Land Reference

Land discloses a system implementing injection of an oxidant below the surface and vacuum extraction from the vadose zone of the resulting oxidized and volatilized contaminants. The vacuum extraction conduit and the oxidant injection conduits are both disposed within the vadose zone and above the groundwater aquifer. A water pump can be implemented for removal of groundwater. (see Land, col. 10, lines 1-24).

More specifically, Fig. 1 illustrates vacuum extraction 4 from the vadose zone 11 through a vacuum extraction conduit 14. Not only is the extraction conduit 14 illustrated as a single pipe configuration, but the disclosure also teaches the implementation of a water pump 2 which may be placed in the vacuum extraction 14 to withdraw groundwater 10 (see column 10, lines 1-5).

Figs. 2 and 3 also illustrate, and the Detailed Description of the Invention discloses, a single pipe vacuum extraction conduit 22 and 34, respectively, for vacuum extraction 18 and 32, respectively, from the vadose zone 27 and 39, respectively. The disclosure of a water pump 2 for removal of the groundwater 10 in conjunction with a vacuum extraction conduit applied to the vadose zone (as illustrated and disclosed in Figs. 2 and 3) fails to teach or suggest a vacuum extraction conduit capable of withdrawing from the contaminated subsurface zone groundwater in a common stream. (see col. 10, lines 6-24).

As such, Land teaches a decontamination system having a *single conduit extraction well* 22 through which a vacuum is applied rendering it capable of vadose zone 27 extraction. Since the Land system itself does not introduce air adjacent the vacuum necessary to maintain the vacuum, such a single tube extraction conduit 22 must be implemented in the vadose zone where there exists sufficient air present in the zone to maintain the vacuum in the extraction conduit 22.

3. Applicant's Claimed Invention

Applicant claims a soil and groundwater decontamination system whereby extraction is facilitated through extraction means having a fluid introducing means surrounding the extraction means (a drop tube disposed inside a well casing). As provided in claim 27, as amended, applicant claims:

> 27. A soil and groundwater decontamination system for decontaminating a contaminated subsurface zone, the contaminated subsurface zone having a groundwater level below which is a groundwater zone and above which is a vadose zone, the vadose zone and the groundwater level having a capillary fringe therebetween, comprising:
>
> a product supply means for introducing a product into said contaminated subsurface zone;
>
> a means for introducing said product into a contaminated subsurface zone, said product being able to react with the subsurface contaminants and produce a reaction end product;
>
> a vacuum means for creating and maintaining a vacuum in at least a portion of said system;
>
> *an extraction means* for extracting a contaminant from the contaminated subsurface zone, said extraction means being in fluid communication with said vacuum means, said extraction means extracting the reaction end products from the contaminated subsurface zone and contaminants from the contaminated subsurface zone; and
>
> *a fluid introducing means* arranged and configured to introduce a fluid substantially adjacent and *surrounding said extraction means*, said extraction means being disposed within said fluid introducing means.

Applicant's Claim 27 (emphasis added).

4. Discussion of the Rejection

It is axiomatic that "[a]nticipation requires the disclosure in a single prior art reference of *each element* of the claim under consideration." W. L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1554, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983)(emphasis added). Therefore, every claimed feature of the claimed invention must be represented in the applied reference to constitute a proper rejection under 35 U.S.C. § 102(b).

Land teaches a *single tube extraction conduit*. Conversely, the present invention claims *a dual tube extraction conduit* comprising an extraction means and a fluid introducing means surrounding the extraction means (a drop tube inside a well casing). Land fails to teach the fluid introducing element or any element concentrically surrounding the extraction means.

Due to these clear shortcomings of the Land reference, applicant respectfully asserts that Land does not anticipate independent claim 27. Therefore, applicant respectfully requests that the rejection of claim 27 under 35 U.S.C. § 102(b) be withdrawn.

F. Claim Rejections - 35 U.S.C. § 103(a)

1. Rejection of Claims 28, 29, 33 and 35-51.

a) Statement of the Rejection

Claims 28, 29, 33 and 35-51 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Land (U.S. Patent 5,615,974).

The rejection alleges that Landshows a method including the steps of introducing a product (Land, Claim 1, step A); allowing the product to react (step B); disposing a well (step C); producing a

vacuum (step D); and extracting the end product (step E). The rejection states that it is apparent from the Figures to a person having ordinary skill in the art at the time of the invention to have used a casing and a drop tube. Applicant respectfully traverses this rejection.

b) The Land Reference

Land discloses a process for in-situ treatment of a contaminated subsurface zone comprising the steps of oxidizing subsurface contaminants to generate heat and oxygen which volatilize and degrade the contaminants; and applying, preferably simultaneously, vacuum extraction to the vadose zone to remove the volatilized contaminants and their oxidation products from the subsurface. (Land, col. 4, lines 42 - 47). More specifically, Land claims a process comprising the steps of: (a) introducing an oxidant into the contaminated subsurface zone; (b) allowing the oxidant to react with the contaminants; (c) *installing* at least one *vacuum extraction well* into the contaminated subsurface zone; (d) *applying a vacuum* to the top of the *vacuum extraction well*; and (e) removing oxidation products of the contaminants through the vacuum extraction. (Land, claim 1).

Looking to the specification, several embodiments for executing the claimed process are disclosed. One of Land preferred embodiments for the process is illustrated in Fig. 1 and disclosed as a surface application of an oxidant 6 and *vacuum extraction 4 of the vadose zone* 11 of the resulting oxidized and volatilized contaminant 8 where *a water pump 2 may be placed in the vacuum extraction conduit 14 to withdraw groundwater 10*. (Land, col. 9, line 67 - col. 10, line 5, emphasis added).

Another embodiment, illustrated in Fig. 2, is disclosed as injection of an oxidant 16 below the surface 26 and *vacuum extraction 18 from the vadose zone 27* of the resulting oxidized and volatilized contaminants 24. In this embodiment the vacuum extraction conduit 22 and the oxidant injection

conduits 20 are both within the vadose zone 27 and above the groundwater aquifer. (Land, col. 10, lines 6-11, emphasis added).

Another disclosed embodiment, and illustrated in Fig. 3, is the process of subsurface injection of an oxidant 28 below the groundwater table 38 and *vacuum extraction 32 from the vadose zone 39* of the resulting oxidized and volatilized contaminants 36. The oxidant injection conduit 30 penetrates the subsurface below the groundwater table 38 so that the oxidant 28 may be injected below the groundwater table 38. The oxidized and volatilized contaminants 36 will percolate up through the groundwater table 38 to the vadose zone 39, the vacuum extraction means 32 will remove the oxidized and volatilized contaminants 36 from below the surface 40 through the vacuum extraction conduit 34. (Land, col. 9, line 66 - col. 10, line 23, emphasis added).

As such, Land clearly teaches a *single conduit extraction well 14* (Fig. 1), 22 (Fig. 2), 34 (Fig. 3). Furthermore, the disclosure of a water pump (Fig. 1) to withdraw groundwater 10 teaches an extraction well 14 withdrawing groundwater and vapor by vacuum extraction in two separate steps through the vacuum extraction conduit 14. (See Fig. 1).

c) Applicant's Claimed Invention

Applicant's claims 28, 29, 33 and 35-51 describe a soil and groundwater decontamination method including, *inter alia*, the steps of *disposing a well casing* into the contaminated subsurface zone and *disposing a drop tube inside the well casing*. As provided in applicant's claim 28, applicant claims:

> 28. A soil and groundwater decontamination method for decontaminating a contaminated subsurface zone, the contaminated subsurface zone having a groundwater level below which is a groundwater zone and above which is a vadose zone, the vadose zone and the groundwater level having a capillary fringe therebetween, said contaminated subsurface zone having a substantially vertically oriented borehole disposed therein, said method comprising

the steps of:

introducing a product into a contaminated subsurface zone, said product having the ability to react with subsurface contaminants;

allowing a reaction between said product and said contaminants, thereby producing a reaction end product;

disposing a well casing having a proximal end and a distal *end into the borehole disposed in the contaminated subsurface zone*;

disposing a drop tube inside said well casing, said drop tube having a proximal end and a distal end corresponding to said proximal end and said distal end of said well casing, respectively;

producing a vacuum in said drop tube; and

extracting the reaction end product from the contaminated subsurface zone and contaminants from the contaminated subsurface zone through the drop tube.

(Applicant's claim 28, emphasis added). Accordingly, applicant's claims define a decontamination method requiring the *disposal of a well casing into the contaminated subsurface zone as well as a drop tube inside the well casing.*

d) Discussion of the Rejection

As acknowledged by the Court of Appeals for the Federal Circuit, the U.S. Patent and Trademark Office ("USPTO") has the burden under section 103 to establish a *prima facie* case of obviousness by showing some objective teaching in the prior art or generally available knowledge of one of ordinary skill in the art that would lead that individual to the claimed invention. See In re Fine, 837, F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). Accordingly, to make a *prima facie* case for obviousness, there must be some prior art teaching or established knowledge that would suggest to a person having ordinary skill in the pertinent art to fill the voids apparent in the applied reference. It is respectfully asserted that no such *prima facie* case has been made in the outstanding Office action.

As described above, Land discloses a *single conduit vacuum extraction conduit* 14, 22, and 44 (Figs. 1, 2, and 3, respectively) through which vacuum extraction is applied to a contaminated

subsurface zone. Conversely, the present invention teaches a *drop tube disposed within a well casing extending into the contaminated subsurface zone*.

In summary, it is applicant's position that a *prima facie* case for obviousness has not been made against applicant's independent claims 28. Therefore, it is respectfully submitted that this claim is patentable over Land and the remainder of the prior art of record. In that claims 29, 33, and 35 - 51 depend from claim 28, and therefore incorporate all the limitations contained therein, it is respectfully submitted that each of claims 28, 29, 33, and 35-51 are patentable over the prior art.

2. Rejection of Claims 1-5, 7, 8, 12, 14-23 and 26.

a) Statement of the Rejection

Claims 1-5, 7, 8, 12, 14-23 and 26 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Land U.S. Patent 5,615,974.

The rejection alleges that the Land reference shows an injection well (16, 20) and explicitly shows all of the other limitations of these claims (as detailed above); with the exception of the vacuum pump, fluid pump, the supply valve, and the drop tube open at the distal end. The rejection states that it would have been obvious to one skilled in the art at the time of the invention to have provided the drop tube with the opening at the end in order to extract reaction products through the tube. Applicant respectfully traverses this rejection.

b) The Land Reference

The Land patent teaches a process for in-situ treatment of a contaminated subsurface zone comprising the steps of: (1) oxidizing subsurface contaminants to generate heat and oxygen which volatilize and degrade the contaminants; and (2) applying, preferably simultaneously, vacuum

extraction to the vadose zone to remove the volatilized contaminants and their oxidation products from the subsurface. (Land, col. 4, lines 41 - 47). The Land patent teaches several preferred embodiments of apparatus for the application of this process. Specifically, Figs. 1, 2 and 3 illustrate preferred embodiments for the implementation of the process.

Fig. 1 illustrates vacuum extraction 4 from the vadose zone 11 through a vacuum extraction conduit 14. Not only is the extraction conduit 14 illustrated as a single pipe configuration, but the disclosure also teaches the implementation of a water pump 2 which may be placed in the vacuum extraction 14 to withdraw groundwater 10 (see column 10, lines 1-5).

Figs. 2 and 3 also illustrate, and the Detailed Description of the Invention discloses, a single pipe vacuum extraction conduit 22 and 34, respectively, for vacuum extraction 18 and 32, respectively, from the vadose zone 27 and 39, respectively. The disclosure of a water pump 2 for removal of the groundwater 10 in conjunction with a vacuum extraction conduit applied to the vadose zone (as illustrated and disclosed in Figs. 2 and 3) teaches a vacuum extraction conduit capable of withdrawing from the contaminated subsurface zone groundwater in a separate step and a separate stream from that extracted from the vadose zone.

c) Applicant's Claimed Invention

Applicant's claims 1 and 26 describe a soil and groundwater decontamination system comprising, *inter alia*, a dual conduit extraction well disposed in the contaminated subsurface zone. As provided in applicant's claim 1, applicant claims:

> 1. A soil and groundwater decontamination system for decontaminating a contaminated subsurface zone, the contaminated subsurface zone having a groundwater level below which is a groundwater (saturated) zone and above which is a vadose zone, the vadose zone and the groundwater level having a capillary fringe therebetween, comprising:
>
> a product having the ability to react with subsurface contaminants and

create a reaction end product;

an injection well, said injection well having a length being defined by a lateral wall, said injection well being disposed in the contaminated subsurface zone, said injection well configured to introduce said product into the contaminated subsurface zone;

a well casing having a proximal end, a distal end, a length therebetween, and a lateral wall, said distal end of said *well casing being disposed in said contaminated subsurface zone*;

a drop tube, said drop tube having a proximal end, a distal end, a length therebetween, and a lateral wall, *said drop tube being disposed inside and extending along said well casing*, said drop tube configured to extract reaction end products from the contaminated subsurface zone and contaminants from the contaminated subsurface zone; and

a vacuum pump, said vacuum pump being in fluid communication with said proximal end of said drop tube.

Applicant's claim 1, emphasis added. Notably, independent claim 26 present in this case, claims a dual-conduit extraction well comprising a well casing and a drop tube disposed therein.

d) Discussion of the Rejection

As acknowledged by the Court of Appeals for the Federal Circuit, the U.S. Patent and Trademark Office ("USPTO") has the burden under section 103 to establish a *prima facie* case of obviousness by showing some objective teaching in the prior art or generally available knowledge of one of ordinary skill in the art that would lead that individual to the claimed invention. See In re Fine, 837, F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). Accordingly, to make a *prima facie* case for obviousness, there must be some prior art teaching or established knowledge that would suggest to a person having ordinary skill in the pertinent art to fill the voids apparent in the applied reference. It is respectfully asserted that no such *prima facie* case has been made in the outstanding Office action.

As discussed above, Land discloses a *single tube extraction conduit*. In contrast, the present invention claims a *dual-conduit extraction well*.

not claimed further not arguing above

In summary, it is applicant's position that a *prima facie* case for obviousness has not been made against applicant's independent claims 1 or 26. Therefore, it is respectfully submitted that each of these claims is patentable over Land and the remainder of the prior art of record. In that claims 2-5, 7, 8, 12, and 14-23 depend from claim 1, and therefore incorporate all of the limitations contained therein, it is respectfully submitted that each of claims 1-5, 7, 8, 12, 14-23 and 26 are patentable over the prior art.

3. Rejection of Claims 30 - 32

a) Statement of the Rejection

Claims 30-32 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Land

The rejection alleges that Land shows all the limitations of these claims (as detailed above) with the exception of the order of combining/injection of the catalyst and product. The rejection states that it would have been obvious to one skilled in the art at the time of the invention to have combined the product and catalyst before, during, or after the injection; or to have injected the catalyst before, simultaneously with, or after the injection of the product. Applicant respectfully traverses this rejection.

b) Discussion of the Rejection

As discussed in detail above, Land discloses a *single tube extraction conduit*. In contrast, and also as discussed above, the independent claim 28 (from which claims 30-32 depend) of the present invention claims a *dual-conduit extraction well*.

It is applicant's position that a *prima facie* case for obviousness has not been made against applicant's independent claim 28, as discussed above. Since claims 30-32 depend from claim 28 and

therefore incorporate all the limitations contained therein, it is respectfully submitted that each of claims 30-32 is patentable over the prior art.

4. Rejection of Claims 6, 13 and 34

a. Statement of the Rejection

Claim 6, 13 and 34 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Land in view of Hess (U.S. Patent 5,050,676).

The rejection alleges that the Land reference shows all the limitation of these claims (as detailed above) with the exception of the filter and the drop tube having an opening in the lateral wall. The Land reference does teach the desirability of treatment with activated carbon (column 7, lines 19-22); but the reference does not disclose how this should be carried out. The Hess reference shows a similar soil contaminant treatment system that incorporated a carbon filter to teach the extracted products. The rejection states that it would have been obvious to one skilled in the art at the time of the invention to have added a filter to the system of Land to teach the extraction products. The rejection further states that it would have been obvious to one skilled in the art at the time of the invention to have provided an opening in the wall of the drop tube in the invention of Land or, alternatively, to have provided a drop tube with an opening as taught by Hess in the system of Land, the opening in the wall of the drop tube would have allowed the extraction of reaction end products from any desired location in the well. Applicant respectfully traverse this rejection.

b. The Hess Reference

Hess discloses a process for vacuum extraction of contaminants from the ground. As illustrated in Fig. 3, and disclosed in column 3, lines 65 - column 4, line 40, the extraction well 28

comprises a riser pipe 44 disposed in a borehole 42 drilled or otherwise disposed into the contaminated subsurface zone. The extraction system 32 is then used to create a vacuum in the riser pipe 42. As such, Hess teaches a single conduit extraction well 28 in the form of a riser pipe 44.

c. Discussion of the Rejection

The disclosure of both Hess and Land (as discussed previously) teach a *single tube extraction conduit*. In contrast and as discussed above, independent claim 1 (from which claim 6 depends) and independent claim 8 (from which claims 13 and 34 depend) of the present invention claim a *dual-conduit extraction well*.

It is applicant's position that a *prima facie* case for obviousness has not been made against applicant's independent claims 1 or 8. In that claims 6, 13 and 34 depend from claims 1 and 8, respectively, and therefore incorporate all the limitations contained therein, it is respectfully submitted that each of claims 6, 13 and 34 are patentable over the prior art.

5. Rejection of Claims 9 and 10

a. Statement of the Rejection

Claims 9 and 10 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Land in view of Nelson (U.S. Patent 5,251,700); or Dela (U.S. Patent 5,277,250); or Devlin (U.S. Patent 5,456,550). The rejection states that the Land reference shows all the limitations of these claims (as detailed above) with the exception of the screen or perforations in the injection well, which is taught in Nelson, Dela and Devlin. The rejection concludes that it would have been obvious to one skilled in the art at the time of the invention to have provided perforations or a screen in the injection well of the Land reference to provide for injection or extraction over a range of depth and to prevent clogging.

b. Discussion of the Rejection

Land, as discussed previously, discloses a *single tube extraction conduit*. In contrast and as discussed above, independent claim 1 (from which claims 9 and 10 depend) of the present invention claims *a dual-conduit extraction well*. As such, applicant respectfully asserts that the Land patent fails to show all the limitations of claims 9 and 10 with the exception of the screen or perforation in the injection well, as asserted in the office action.

It is applicant's position that a *prima facie* case for obviousness has not been made against applicant's independent claim 1 (as discussed above); in that claims 9 and 10 are dependent from claim 1, and therefore incorporate all the limitations contained therein, it is respectfully submitted that each of claims 9 and 10 are patentable over the prior art.

6. Rejection of Claim 11

a. Statement of the Rejection

Claim 11 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Land in view of Braithwaite (U.S. Patent 5,249,888).

The rejection alleges that the Land reference shows all of the limitations of claim 11, with the exception of the closed end of the well casing. The rejection concludes that it would have been obvious to one skilled in the art at the time of the invention to have closed the end of the well casing of the Land invention to assist in driving the casings into the ground.

b. The Braithwaite Reference

The Braithwaite reference discloses an enhanced pressure gradient remediation system for decontaminating a contaminated volume of soil incorporating at least one extraction well. The

extraction probe 40 disclosed in Braithwaite is "substantially similar to the injection probe 18." (column 3, lines 31-33). Braithwaite's injection probe 18 is constructed of an elongated hollow tube 26 having apertures 28 formed therein (column 2, lines 62-63). As such, Braithwaite teaches an extraction probe comprising a single hollow tube.

c. Discussion of the Rejection

Both Braithwaite and Land (as discussed previously) discloses a *single tube extraction conduit.* In contrast, applicant's claim 1 (from which claim 11 depends) of the present invention claims a *dual-conduit extraction well.*

It is applicant's position that a *prima facie* case for obviousness has not been made against applicant's independent claim 1 with respect to the Land patent (as discussed above) or the Braithwaite patent. In that claim 11 is dependent from claim 1, and therefore incorporates all the limitation contained therein, it is respectfully submitted that claim 11 is patentable over the prior art.

7. Rejection of Claims 24, 25, 52 and 53

a. Statement of the Rejection

Claims 24, 25, 52 and 53 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Land in view of Vigneri (U.S. Patent 5,286,141).

The rejection alleges that the Land reference shows all of the limitations of the claims with the exceptions of the surfactant and cosolvent. Vigneri teaches the use of surfactant in a similar system. The rejection concludes that it would have been obvious to one skilled in the art at the time of the invention to have used a surfactant in the invention of Land. in the manner of Vigneri in order to improve the properties of the product. The rejection further concludes that it would have been further

obvious to one skilled in the art to have added a cosolvent as it is well known in the art the cosolvents can be used to enhance the properties of surfactants.

b. Discussion of the Rejection

Land (as discussed above) discloses a *single tube extraction conduit* while Vigneri disclosure does not teach or disclose vacuum extraction. In contrast and as discussed above, Applicant's independent claim 1 (from which claims 24 and 25 depend) and independent claim 28 (from which claims 52 and 53 depend) both claim a *dual-conduit extraction well.*

It is applicant's position that a *prima facie* case for obviousness has not been made against applicant's independent claims 1 or 28 in that neither Land nor Vigneri teach a multi-conduit extraction well. In that claims 24 and 25 depend from claim 1 and claims 52 and 53 depend from claim 28, and therefore incorporate all the limitations contained therein respectively, it is respectfully submitted that each of claims 24, 25, 52 and 53 are patentable over the prior art.

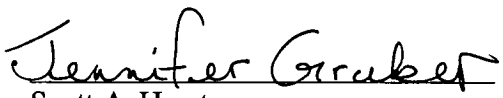
G. Other References Cited in the Action

In addition to the references applied in the Office action, it is respectfully submitted that applicant's invention, as now recited in claims 1-53 are neither anticipated nor rendered obvious by any of the other references cited in the Office action either taken alone or in combination.

CONCLUSION

In summary, it is respectfully submitted that claims 1-53 define a soil and groundwater decontamination system comprising an injection well arranged and configured to introduce a product into a contaminated subsurface zone and a dual-conduit extraction well comprising a drop tube disposed internal to a well casing which embodies a distinct advance in the art not rendered obvious by the cited art of record. Accordingly, an early Notice of Allowability would be appreciated and is therefore respectfully solicited. Should the Examiner have any questions regarding this response, he is invited to telephone the undersigned attorney.

Respectfully submitted,



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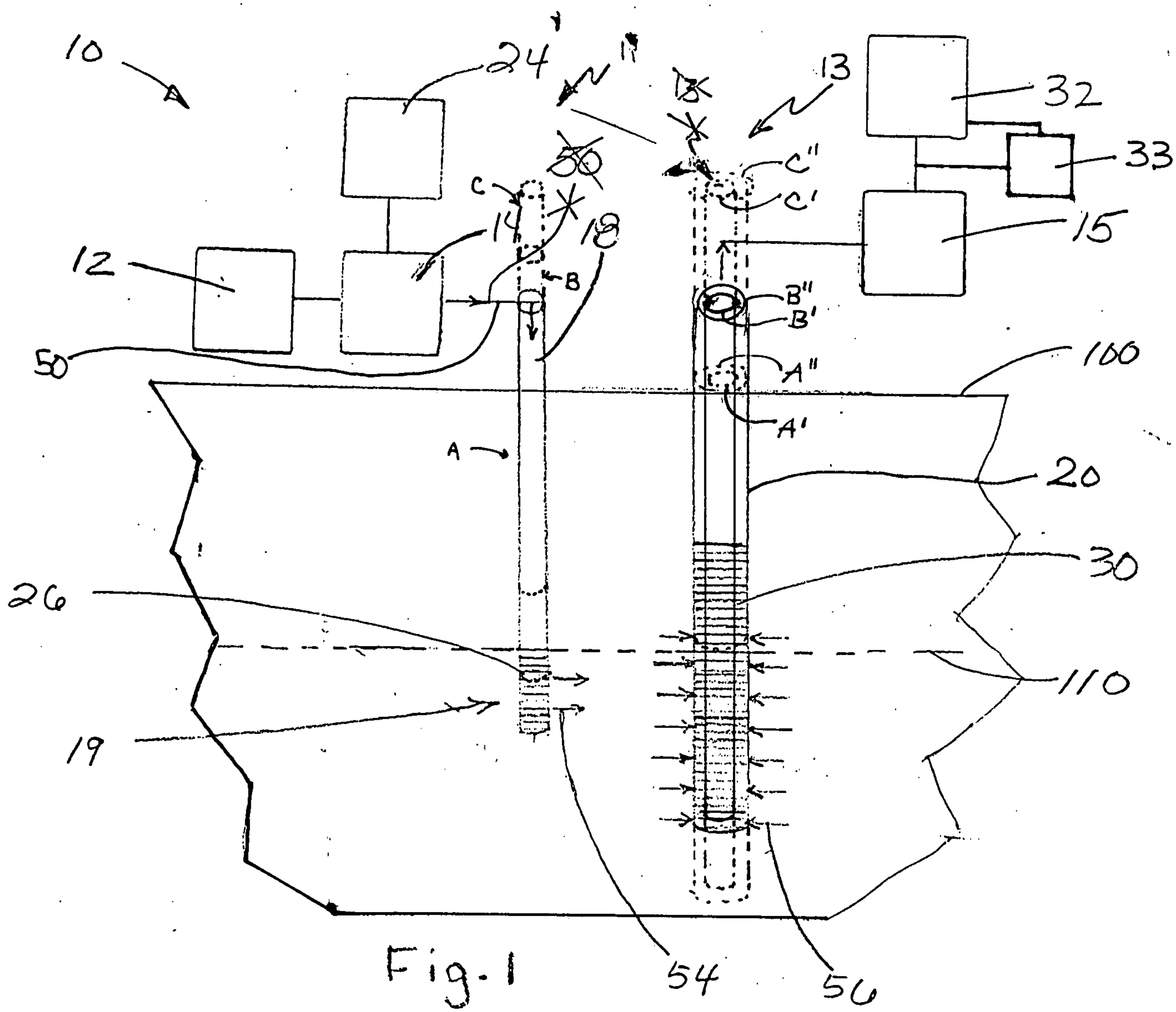

Fig-1

Corrections approved OK 7-11-00